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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/689,754 | 10/20/2003 | Masaaki Kusumi | KOIKE-01100 | 6013 |

7590 09/15/2006

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EXAMINER

BERNATZ, KEVIN M

ART UNIT PAPER NUMBER

1773

DATE MAILED: 09/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/689,754

Applicant(s)

KUSUMI ET AL.

Examiner

Kevin M. Bernatz

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1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Response to Amendment

1. Amendments to claims 1 – 3, 6 – 9 and 12, and addition of claims 13 - 18, filed on June 21, 2006, have been entered in the above-identified application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Request for Continued Examination

3. The Request for Continued Examination (RCE) under 37 CFR 1.53 (d) filed on June 21, 2006 is acceptable and a RCE has been established. An action on the RCE follows.

Claim Rejections - 35 USC § 103

4. Claims 13 – 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kokai et al. (U.S. Patent No. 4,755,426) in view of Gonsel et al. (U.S. Patent App. No. 2002/0114980 A1) for the reasons of record as set forth with regard to claims 1 - 6 in Paragraph No. 5 of the Office Action mailed on February 13, 2006 (*which refers back to Paragraph No. 4 of the Office Action mailed on September 1, 2005*).

Regarding claims 13 and 15, Kokai et al. disclose membranes formed of amorphous carbon hydride (i.e. diamond-like carbon, DLC) per the same reasons noted with regard to claim 2.

Regarding claim 14, Kokai et al. disclose an intermediate film meeting applicants' claimed structural limitation per the same reasons as noted with regard to claim 3.

5. Claims 16 – 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kokai et al. ('426) in view of Gonsel et al. ('980 A1) as applied above, and further in view of applicants' admissions for the reasons of record as set forth with regard to claims 7 - 12 in Paragraph No. 6 of the Office Action mailed on February 13, 2006 (*which refers back to Paragraph No. 5 of the Office Action mailed on September 1, 2005*).

6. Claims 1 – 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kokai et al. ('426) in view of Gonsel et al. ('980 A1) as applied above, and further in view of Skorjanec et al. (U.S. Patent No. 4,729,924).

Regarding claims 1 – 6, Kokai et al. and Gonsel et al. are relied upon as described above in Paragraph 4.

While Kokai et al. disclose forming a surface oxide layer on the magnetic layer in order to increase the durability of the recording medium (*col. 5, lines 59 – 64*), Kokai et al. fail to disclose either forming a nitride layer, or the equivalence of nitriding versus oxidizing the surface of the magnetic layer.

However, Skorjanec et al. disclose that oxidizing (*as per the teachings of Kokai et al.*) or nitriding the surface of a magnetic layer (*including cobalt based magnetic layers*) is known in the art as functioning equivalently for improving the adhesion of

organic material to the surface treated magnetic layer (*col. 1, line 58 bridging col. 2, line 23*). The Examiner notes that the layer directly deposited onto the surface treated magnetic layer per the teachings in Kokai et al. is the first, organic, protective layer (*col. 3, lines 29 – 35*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Kokai et al. in view of Günsel et al. to form a nitride film meeting applicants' claimed limitations as taught by Skorjanec et al., since one of ordinary skill in the art would recognize that the nitride film provides equivalent benefit as the Kokai et al. taught oxide film.

7. Claims 7 – 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kokai et al. ('426) in view of Günsel et al. ('980 A1) and applicants' admissions as applied above, and further in view of Skorjanec et al. ('924).

Regarding claims 1 – 6, Kokai et al., Günsel et al. and applicants' admissions are relied upon as described above in Paragraph 5.

While Kokai et al. disclose forming a surface oxide layer on the magnetic layer in order to increase the durability of the recording medium (*col. 5, lines 59 – 64*), Kokai et al. fail to disclose either forming a nitride layer, or the equivalence of nitriding versus oxidizing the surface of the magnetic layer.

However, Skorjanec et al. disclose that oxidizing (*as per the teachings of Kokai et al.*) or nitriding the surface of a magnetic layer (*including cobalt based magnetic layers*) is known in the art as functioning equivalently for improving the adhesion of

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organic material to the surface treated magnetic layer (*col. 1, line 58 bridging col. 2, line 23*). The Examiner notes that the layer directly deposited onto the surface treated magnetic layer per the teachings in Kokai et al. is the first, organic, protective layer (*col. 3, lines 29 – 35*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Kokai et al. in view of Günsel et al. and applicants' admissions to form a nitride film meeting applicants' claimed limitations as taught by Skorjanec et al., since one of ordinary skill in the art would recognize that the nitride film provides equivalent benefit as the Kokai et al. taught oxide film.

Response to Arguments

8. The rejection of claims 1 - 18 under 35 U.S.C § 103(a) – Kokai et al. in view of various references

There are essentially two arguments put forth by applicants regarding the alleged failing of the prior art to teach or render obvious the claimed invention. The first argument is that neither Kokai et al. nor Günsel et al. teach an intermediate layer meeting the claimed limitations (*page 7 and page 9 of response*). The second argument is that neither Kokai et al. nor Günsel et al. teach a film of amorphous carbon hydride containing C and H as the bases (*also pages 7 and 9 of response*). In both cases, the Examiner respectfully disagrees.

With regard to the first argument, the Examiner deems that a Figure might better explain the reasoning why the Examiner deems that the prior art meets the claimed structural limitations. In Figure 1 below, the first protective layer can be represented by two distinct layers, a lower portion - low oxygen content (Ox) layer - and an upper, surface portion - high oxygen content (Ox) layer - (*see col. 3, lines 40 – 45: “When the first protective layer made of the polymer is subjected to plasma treatment in an oxygen-containing atmosphere (pure oxygen or oxygen containing gas) so as to increase the content of oxygen near the surface of the first protective layer, adhesion of the carbonaceous second protective layer and the first protective layer is further improved”, emphasis added*). It is this surface oxidized portion of the first protective layer which the Examiner deems reads on the limitation “intermediate layer”, especially since it meets all the material limitations for the “intermediate layer” (e.g. *claims 4 – 6*).

| Claimed Layers | Kokai et al. disclosure |
|--------------------|------------------------------------|
| Membrane Layer | Carbonaceous Layer |
| Intermediate Layer | Polymer Layer with high Ox content |
| Organic Layer | Polymer Layer with low Ox content |
| Inorganic Layer | Oxide Surface of Magnetic Layer |
| Magnetic Layer | Magnetic Layer |

Figure 1: Illustration of 5 layered structure taught by Kokai et al.

With regard to the second argument, the Examiner notes that applicants appear to be missing the explicit teaching in Kokai et al. to use amorphous carbon materials and diamond-like carbon materials for the second carbonaceous protective layer (i.e. applicants' "membrane") (see *col. 2, lines 24 – 28 and col. 5, lines 49 – 51 of Kokai et al.*).

Conclusion

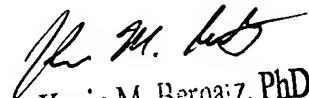
9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wu et al. (U.S. Patent App. No. 2003/0228497 A1) disclose the known equivalents of an oxide or nitride layer in improving the adhesion of a metal oxide protective layer (*entire disclosure and abstract*). Suzuki et al. (U.S. Patent No. 6,680,112 B1) disclose the known equivalents of an oxide or nitride layer in improving the adhesion of a polymeric layer to another layer under the oxide or nitride layer, but Suzuki et al. is directed to forming the oxide or nitride layer on a carbon layer, not a magnetic layer (*col. 7, line 20 bridging col. 8, line 29*).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMB
September 12, 2006


Kevin M. Bernatz, PhD
Primary Examiner